

TO: ALL REGENCY COMMUNICATIONS PROFESSIONAL SALES AND SERVICE CENTERS  
ALL REGENCY COMMUNICATIONS PROFESSIONAL SALES REPRESENTATIVES

MODEL AFFECTED: MCA611A

#### SERVICE MANUAL ERRATA

Remove Test Procedure - Two-Tone Sequential Decoder - TP-14-296 from your MCA611A Service Manual (0300-4187-800), and replace it with the attached pages.

Correction on page 2 - "The reading at Pin 1 of IC402" has been changed to "The reading at Pin 1 of IC401".

TECHNICAL SERVICE DEPARTMENT

REGENCY COMMUNICATIONS, INC.





REV B	APPLICATION		REVISIONS			
	NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
		MCA611A	A	R557	3-26-81	C. Haysen
			B	AC143	2-3-82	COH
			C	AC414	6-3-82	JD

TEST PROCEDURE

TWO-TONE SEQUENTIAL DECODER  
(APPLIED TO MCA611A)

I. Sequential Tone Decoder Set-Up and Testing

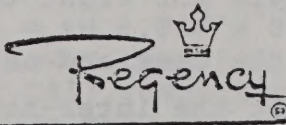
A. Equipment required

- 1. R.F. Signal Generator
- 2. Two-Tone Sequential Generator
- 3. Frequency Counter
- 4. Power Supply (13-16 VDC)
- 5. Oscilloscope

B. Radio Preset

- 1. Connect DC power supply to DC power connection, top pin of 3-pin connector on the back of the radio. (The DC power supply can be substituted by using the radio's own AC supply; 117V 60 Hz.)
- 2. Set radio controls as follows:
  - a. Volume - comfortable listening level.
  - b. Squelch - upper most slide position.
  - c. Alert/monitor switch - in alert position.
  - d. Duty switch - in normal position.
  - e. Frequency switch - in normal position.
  - f. On/Off switch - in ON position.
- 3. Set the frequency of the RF signal generator to the normal crystal frequency (the frequency of the crystal in the socket farthest from the speaker).
- 4. Externally modulate the RF signal generator with the two-tone oscillator, making sure each tone is modulated at 3 KHz deviation.

NOTE: Tone range division into three bands. Change C401, 416, and 417 per chart schematic drawing number 704-070.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE  FRACT. DEC                      ANG. ±       .xx±                      ± .xxx±	APPROVALS	DATE	<div> COMMUNICATIONS INC. SATELLITE BEACH, FLORIDA 32937</div> <div>TEST PROCEDURE - TWO-TONE SEQUENTIAL DECODER (APPLIED TO MCA611A)</div>		
	DRAWN	G-m			3/16/81
	CHECKED				
	OFTG. SUPV.				
MATERIAL	ENGR.	C. Haysen	3-26-81		
FINISH					
DO NOT SCALE DRWG.			SIZE	A	
			PART NUMBER	TP-14-296	
			SCALE		
			SHEET	1 OF 4	
			REV	C	



C. Clock adjustments

1. Using a frequency counter -

- a. Connect a high input impedance amplifier to Pin 1 of IC401 in the radio.
- b. Connect the output of the amplifier to the input of an accurate frequency counter.
- c. Adjust R401 until the counter reads eight times the value of the first tone (Tone A).
- d. Disconnect the probe of the amplifier going to Pin 1 of IC401 and connect it to Pin 1 of IC402.
- e. Set Tones B and C; pull up D19, allow it to hang free (Pin 7 IC402 ungrounded); adjust R418 until the frequency counter reads eight times the desired second tone frequency (Tone B).
- f. Ground the end of JO402 that came off D19 to the case; adjust R420 until the counter reading is eight times the third or C tone frequency.
- g. Replace JO402 on D19.

D. Adjusting the Inter-Tone Timing

1. Modulate RF signal generator with Tone A.
2. Connect oscilloscope to Pin 17 of IC403.
3. Adjust R417 for this period.

One-shot period = period of 1st tone + period delay + period 2nd tone.

4. Modulate RF signal with the two-tone sequence.
5. The message light will come on and the squelch will open.

Example: Suppose the following frequencies were needed:

TONE A - 349.0  
TONE B - 389.0  
TONE C - 410.8

Using an accurate frequency counter -

The reading at Pin 1 of IC401 must be adjusted to  $8 \times 349.0 \text{ Hz} = 2,792 \text{ Hz}$ .

The adjustment is done with R401.

The order of the next two Tones B and C is unimportant.

With the probe on Pin 1 of IC402 and JO402 pulled up, adjust R418 for eight times one of the other tones - say Tone C,  $8 \times 410.8 \text{ Hz} = 3,286.4 \text{ Hz}$ . Now ground the jumper against the case and adjust R420 for  $8 \times 389.0 \text{ Hz} = 3,112 \text{ Hz}$ .

Now adjust the inter-tone timing according to your requirements. Suppose the period of the first tone is .75 sec. and the period between tones is .5 sec the final tone is also .75 sec, then -

DRAWN	G.M	DATE 3/16/81	SIZE	PART NUMBER	REV.
APPROVED	C. Hyson	DATE 3/26/81	A	TP-14-296	C
DO NOT SCALE DWG.		SCALE		SHEET 2	



REV. B  
3  
DWG. NO. TP-14-296

One-shot period = period of 1st tone + period delay +  
period 2nd tone = .75s + .5s + .75s = 2s

The adjustment is made with R417 and set with the scope probe on Pin 17 of IC403.

6. If impedance problems are encountered while setting the one-shot period, Pin 16 of IC403 can also be used as its logical state changes from logical high to logical low for the exact same amount of time as the one-shot period. At the end of the one-shot period it goes high again.

#### E. Unit Testing

##### 1. With Carrier Reset Option -

- Set alert/monitor switch into monitor position.
- With no RF signal applied, adjust squelch for desired squelching action.
- Return alert/monitor switch back to the alert position.
- Apply enough RF signal to quiet the receiver and signal the unit with the proper two-tone sequence.
- The squelch should open allowing the listener to hear the remainder of the second tone's duration and the message lamp should flash at a high rate.
- Turn off applied RF signal so that the radio goes into squelched mode. The decoder is now reset and no other signal other than the proper two-tone sequence will open the squelch.
- The MSG LED should remain flashing until the reset switch is moved into the reset position.

##### 2. With Time-Out Reset Option -

- Turn up RF signal enough to quiet the receiver.
- Modulate the signal generator with the proper two-tone sequence.
- The squelch should open, allowing the receiver to operate normally for a given period of time. This time period can be adjusted by varying R293. The MSG LED will be flashing at a very fast rate and will remain flashing when the decoder has been reset.
- The MSG LED can be reset by pushing the reset switch to the right.

#### F. Acceptable Performance Limits

Frequency Range*	208 - 3,906 Hz
Frequency Counter will read	1,664. - 31,248.
Decoder Sensitivity	12dB Sinad 100% detect
	6dB Sinad 75% detect

Audio Input at Pin 6 of IC403  
must be

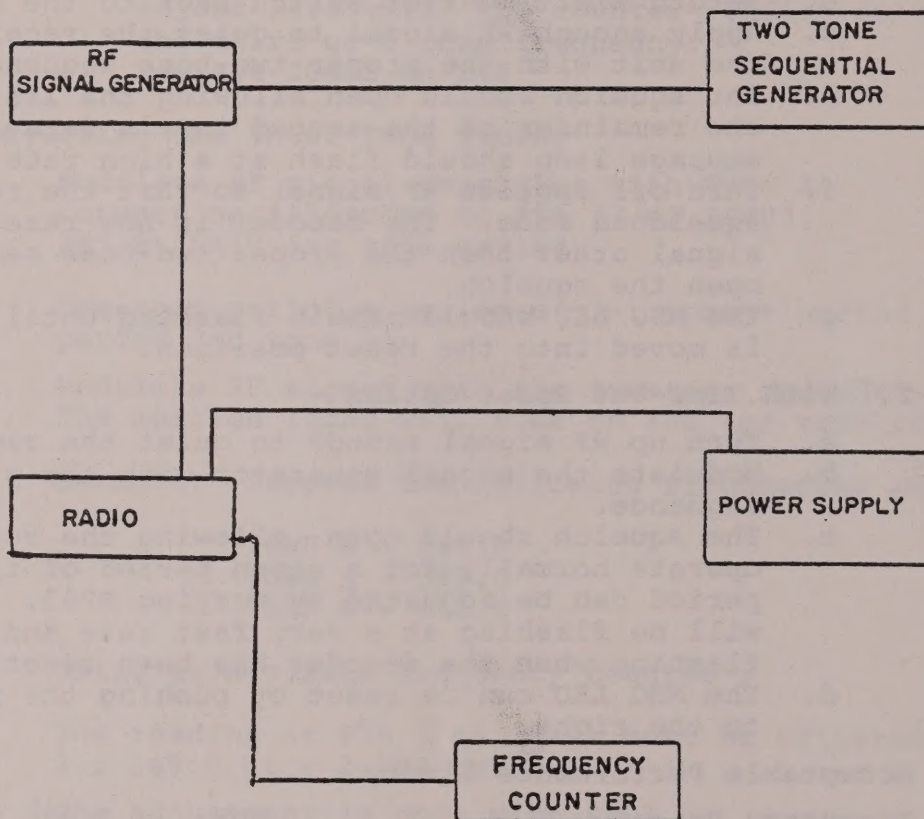
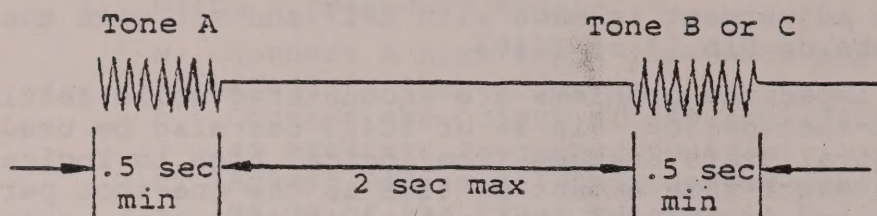
1.3Vpp or greater

\*For tone frequencies lower than 300 Hz it may be necessary to change C401, C416, or C417, respectively to 820pf for those oscillators below 300 Hz only.

DRAWN	C M	DATE	3/16/81	SIZE	A	PART NUMBER	TP-14-296	REV.	C
APPROVED	C Hyson	DATE	3/16/81	SCALE				SHEET	3
DO NOT SCALE DWG.									



# PROPER TONE SEQUENCE



TEST INTERCONNECTION DIAGRAM

FIGURE - 1

DRAWN	GM	DATE 3/12/81	SIZE A	PART NUMBER TP-14-296	REV. C
APPROVED C Hyson		DATE 3/24/81			
DO NOT SCALE DWG.		SCALE		SHEET 4/	